



Recognition and Rating of Operationalization and Influencing Factors on Internal Audit Effectiveness in Ministry of Health and Medical Education by matrix mathematic calculations

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ABSTRACT

Subject and Purpose of the Paper: Public sector should be expected not only to consider potentially influential factors of Internal auditing, but also to assess their actual impact in the public sector through well-defined indicators. Influential factors and how the effectiveness of Internal auditing are quantified or operationalized very important. The purpose of this research is Recognition and Rating of Operationalization and Influencing Factors on Internal Audit Effectiveness in public sector.

Research Method: This research is practical and exploratory. The Delphi (12 experts) was used for identification and the Analytical Hierarchy Process (20 experts) was used for ranking.

Research Findings: The components affecting the effectiveness of internal audit included objective and subjective effectiveness, and the operationalization components of internal audit effectiveness were identified in two dimensions of supply and demand. The most important component of objective effectiveness was the time to resolve internal audit findings, and the most important component of subjective effectiveness was the effectiveness of internal audit perceived by the stakeholders. From the supply side of operationalization, the ability of the internal audit department to perform activities was also the most important component, and from the demand side, management support from internal audit was the most important component.

Conclusion, Originality and its Contribution to the Knowledge: Effectiveness and operationalization are two important dimensions of internal audit effectiveness. By considering the increasing importance of internal audit in the public sector in recent years, the results of this research are effective in increasing the effectiveness of internal audit.

Keywords: Operationalization Factors of Internal Audit Effectiveness, Influencing Factors of Internal Audit Effectiveness, Delphi Method, Analytical Hierarchical Process, Ministry of Health and Medical Education

1. Introduction

Iran's economy is a state economy and every year very large sums of money are allocated to executive bodies and are used by them in the form of annual budgets. Examining the trend of recent years indicates the increase in the budget of government organizations and institutions. Possessing a large amount of economic resources and the possibility of non-optimal use of resources and facilities, lack of efficiency and effectiveness in the consumption and spending of public funds, and the failure to discover these cases by managers of executive bodies are risks that public organizations always face. The control process is one of the most important processes that every organization needs to ensure its survival and to know how its programs function and execute [1,2].

One of the most important control processes performed by managers is internal audit. Senior managers must closely monitor the performance of the organization. Therefore, an active monitoring unit under the supervision of the management performs this task. These units affect managers' decisions and are therefore very important. They should also consider strengths and weaknesses, opportunities and threats. The above states that it is necessary to evaluate the effectiveness of the public sector supervisory units in order to identify the effectiveness and success rate and the factors affecting it and to organize and then plan in order to strengthen the factors. The task of establishing appropriate accounting and internal control systems is the responsibility of the management of the business unit, but senior managers and officials usually assign the task of reviewing these systems, monitoring and controlling their implementation, and providing corrective suggestions to a unit called internal audit. Internal audit helps the management of economic units in fulfilling their duties through the review and evaluation of internal controls. Nowadays, the management system of companies is responsible for guiding and controlling the organization towards its goals or the main goal which is creating value for the beneficiaries and stakeholders, and internal audit is known as an integral part of the management system of the organization. Most of the standard-setters (including the International Association of Internal Auditors), executives, researchers and business communities have written materials about internal auditing in the private and public sectors. In practice, internal audit is designed to add value and improve the

operations of organizations, so there is a belief that internal audit provides a basis for the most controversial issues regarding the governance and accountability of people-oriented organizations [3].

One of the most important people-oriented organizations is the Ministry of Health, Treatment and Medical Education, whose main mission is to provide health and treatment for all people in the country through the generalization and expansion of health, medical and educational services. One of the most important tasks that helps in fulfilling the missions of this ministry is internal audit. Internal audit (IA) is considered as an important tool to control the governance and operation of public sector. Initially, the Internal audit function focused on compliance assurance, financial control and assets safeguarding. In the recent years, Internal audit has experienced changes that have resulted in the extension of the area of involvement and the increase of its value adding potential. The Institute of Internal Auditors (IIA) has elaborated a definition of Internal audit, which is now widely accepted:

Internal auditing is an independent, objective assurance and consulting activity designed to add value and improve an organization's operations. It helps an organization accomplish its objectives by bringing a systematic, disciplined approach to evaluate and improve the effectiveness of risk management, control, and governance processes [2].

Nowadays, the added value of Internal audit draws attention from all audit stakeholders because of the increase in regulatory requirements and focus on governance and risk management in public sector. The requirements assigned to the Internal audit function by internal and external stakeholders are constantly increasing and changing the attention given to this function. Previously, the roles, responsibilities, contributions to internal and external stakeholders and the recognition by the organization were the focuses of Internal audit, whereas now, it has shifted to how Internal audit can bring value to the organization. However, the extent of added value that Internal audit can bring to the organization depends on how effectively it is managed in the organization.

A typical evaluation of Internal audit performance is a comparison of the actual performance with the predefined objectives, including the measurement of the achieved effectiveness and efficiency. The term "effectiveness" has been defined as "the capacity to

obtain results that are consistent with target objective". Also, can define the term as "the achievement of a desired condition." Although this condition is often not well defined, it can be measured in degrees. Efficiency, on the other hand, relates to the degree that the organization utilizes its resources in producing measurable outputs. Aligned with the common understanding of the terms, effectiveness is "doing the right thing," while efficiency is "doing it well" [2,4].

effectiveness and efficiency have to be measured separately, as there is a possibility that the audit is effective but not efficient, and vice versa. For instance, all objectives have been achieved but with a great amount of expense. By contrast, it is possible that the audit is efficient and the auditors spend little time on audit activities, but the objectives are not achieved. effectiveness is a more important aspect than efficiency because if Internal audit is not effective, it is worthless regardless of how efficient the audit is. If the Internal audit quality is maintained, it will contribute to the adherence of the process and operations to the regulation or standard, and thus, Internal audit contributes to effectiveness of the auditee in particular, and the organization as a whole [2,4,5]. Internal audit is one of the important strategies to improve the independent audit [6].

Organizations in Public sector for example Ministry of Health and Medical Education should be expected not only to consider potentially influential factors of Internal auditing, but also to assess their actual impact in the public sector through well-defined indicators. influential factors and how the effectiveness of Internal Auditing is quantified or operationalized very important. The purpose of this research is Recognition and Rating of Operationalization and Influencing Factors on Internal Audit Effectiveness by Delphi Method and Analytical Hierarchical Process in Ministry of Health and Medical Education.

This research including below questions:

First question: What are the components based on the study of the research literature and the opinion of experts to operationalize the effectiveness of the internal audit of the Ministry of Health and Medical Education?

Second question: What components are effective on the effectiveness of internal audit of the Ministry of Health and Medical Education based on the study of research literature and the opinion of experts?

Third question: Which of the components of the operationalization of the effectiveness of the internal audit of the Ministry of Health and Medical Education are more important?

Fourth question: Which of the components of the effectiveness of the internal audit of the Ministry of Health and Medical Education are more important?

The reason for the importance of answering the above questions is that In recent years, more attention has been paid to the subject of internal audit, so that the Ministry of Economic Affairs and Finance, in a letter in 1401, to the managers of the affairs and economy and finance departments of the provinces on the necessity of implementing Article (90) and Article (94) Public Accounts Law emphasized and presented a written package of internal audit measures in the form of detailed checklists in relation to the control of the following:

- Controls in the area of expense credits
- Controls in the area of credits for the acquisition of capital assets
- Necessary controls for financial reports [2].

This shows that the importance of internal audit in the public sector is increasing.

From the international perspective, the International Organization of Supreme Audit Institutions (INTOSAI) is an intergovernmental, self-governing, independent and non-political organization for government audit institutions around the world. Our country is also a member of this organization that must follow the standards of INTOSAI.

The published standards related to internal audit are as follows:

- 1) ISSAI 1610 – Using the Work of Internal Auditors
- 2) ISSAI 1265 – Communicating Deficiencies in Internal Control to Those Charged with Governance and Management
- 3) INTOSAI GOV 9100 – Guidelines for Internal Control Standards for the Public Sector
- 4) INTOSAI GOV 9110 – Guidance for Reporting on the Effectiveness of Internal Controls: SAI Experiences in Implementing and Evaluating Internal Controls
- 5) INTOSAI GOV 9120 – Internal Control: Providing a Foundation for Accountability in Government
- 6) INTOSAI GOV 9130 – Guidelines for Internal Control Standards for the Public Sector –

Further Information on Entity Risk Management

- 7) INTOSAI GOV 9140 – Internal Audit Independence in the Public Sector
- 8) INTOSAI GOV 9150 – Coordination and Cooperation between SAIs and Internal Auditors in the Public Sector [2].

All these cases show the increase in the importance of internal audit in the public sector, which will be investigated in this research.

Literature

The main component of accountability is corporate governance, and corporate governance uses several tools such as internal controls, risk management, internal audit, and audit committee to achieve the accountability component. Meanwhile, efficient and effective internal audit is one of the most important components of corporate governance [2,4].

With the increase in the level of financial and operational accountability, the concepts of control and the objectives and components of internal control are adjusted accordingly. Some components of internal control, such as information and communication and control methods, in the non-profit activities of the government and large public sector organizations have many differences compared to commercial activities, and in some components such as the control environment and risk assessment and supervision. These differences do not seem significant. The role of internal audit in public institutions has become more and more important in the last two decades, because the government administration and continuous changes in government units and public institutions are happening rapidly. The concept of internal audit in the public sector, which is called public internal audit, is an independent and reassuring review of the business unit's activities along with advice to managers for the optimal management of public revenues and expenditures and improving the activities of the public sector. The functions of internal audit in the private sector are also available at the level of government units and public institutions, but the purpose of accountability should also be considered for this sector [2,4].

The wide and diverse activities of the public sector and the structure of this sector, together with the increase in requests to consider the quality of services demanded and of course the limitations that prevail in

this sector, make it necessary to use internal controls and audits in this sector. Today, public sector managers are facing a complex and challenging environment. Despite this, public sector managers have a range of mechanisms available to help them fulfill their responsibilities. Controls and internal audit are considered a desirable function to help the management of the public sector. This function includes monitoring, evaluation, quality assurance and self-evaluation activities and is designed in a way that provides confidence and self-confidence for the board of directors and executive directors for their responsibility and accountability. The focus of today's internal audit is value creation, and this point is of interest to all stakeholders. Value creation depends on the effectiveness of internal audit in the organization along with the management of factors affecting it. The concept of effectiveness in the internal audit unit of the public sector is a suitable standard for evaluating, controlling and measuring performance in the field of internal audit activities, which is in accordance with the highest international standards in order to achieve the demands of audit activities. Measuring the two categories of efficiency as doing the job right and effectiveness as doing the job right can be both quantitative and qualitative [2,4].

The components that exist for quantifying and operationalizing the effectiveness of internal audit are proposed from two aspects of supply and demand. From the supply side, things like the capability of the internal audit department, the size of the internal audit department, organizational arrangement, scope limitation, compliance with applicable standards, the characteristics of the audited unit, the independence of the internal auditor, the impartiality of the internal auditor, risk management consulting, outsourcing, work quality. It includes audit and leadership style of managers. From the demand side, it includes things like management support for internal audit, interaction between internal auditor and independent auditor, cooperation with the audit committee, information and communication, existence of follow-up process, support control environment and cultural dimensions. The components affecting the effectiveness of internal audit are classified into two objective and subjective categories. The objective effectiveness includes the degree of practicality of the internal audit plan, the time required to complete the audit plan, the percentage of recommended implementation, the

publication time of the internal audit report, the time to solve the internal audit findings, time management, the number of audit findings and the audit value. Subjective effectiveness includes perceived internal audit effectiveness, stakeholder satisfaction, and perceived added value for the organization [4,7,8]. The following research has been observed and reviewed in relation to internal audit:

Several studies have also introduced internal audit as one of the most important corporate governance strategies. In such a way that almost the accountability of organizations is considered incomplete without this importance. They have stated that internal audit has a tremendous impact on the management of possible risks and managers should provide detailed planning to

increase the effectiveness and efficiency of internal audit [13,14,15,16].

A study in EU countries showed that internal audit is a very important activity in risk management and should be done completely independently from other control activities to achieve greater effectiveness [17]. Another study showed that the definition of the effectiveness of internal audit in China is different from the Persian Gulf countries, and each country should have its own internal audit system [18]. The internal audit system effectiveness within each country, Denmark, Finland, Iceland, Norway and Sweden, is different and also the regulatory basis, laws and regulations, for internal audit and the main challenges that internal auditing faces. These countries should have its own internal audit system [19].

Table 1: Previous research

Result	Title	Reference
he relationship between the annual internal audit budget and ESG performance is contingent on the sourcing arrangement of the internal audit function. Specifically, the results show that the annual internal audit budget has a positive impact on ESG performance for firms with an in-house internal audit function but not for firms outsourcing an internal audit function to external providers. Overall, the results suggest that the annual internal audit budget promotes ESG performance for firms performing their internal audit activities internally.	Does internal audit function outsourcing policy matter for environmental, social and governance performance score? Evidence from Bursa Malaysia	[7]
This research confirmed the impact of the Internal Audit Function (IAF), Internal Control (IC), and Fraud Prevention (FP) on governance (GOV). Additionally, this study examines whether IC and FP mediate the relationship between the IAF and GOV.	Enhancing fraud prevention and internal control: the key role of internal audit in public sector governance	[8]
Internal audit focuses on various themes such as the best practices of organizational governance (corporate governance), protecting stakeholders, maintaining rule of law and trust in the public sector, and focusing on transparency and accountability	Internal audit in the public sector	[3]
The problems in internal audit effectiveness are mainly reflected in audit management system barriers, high losses and waste, ineffective audit reform and lagging audit innovation	Measuring the effectiveness of internal audit	[9]
The operationalization components of internal audit effectiveness were presented from the supply side and from the demand side. The components affecting the effectiveness of internal audit were also presented in two dimensions: objective effectiveness and subjective effectiveness	The effectiveness of internal audit: operationalization and the components affecting it	[4]
Internal audit plays a fundamental role in improving the internal control system in the public sector	The role of integrity system, internal control system, and leadership practices regarding accountability in the Malaysian public sector	[10]
A larger internal audit team can enhance internal audit performance for both operations and compliance, while internal auditor competence is positively related to internal control effectiveness over compliance, but not operations	The effect of internal audit characteristics on the effectiveness of internal controls related to the goals of complying with laws and operational efficiency	[1]
confirmed the effect of the leadership style of the internal audit manager on the factors related to the effectiveness of the internal audit	The influence of internal audit manager's leadership style on factors related to internal audit effectiveness	[11]
The organizational position of the internal audit and the ability of the internal audit have a significant effect on the fraud management in the audit	Organizational position of internal audit, qualifications, activities and fraud management in the financial services sector	[12]

Methodology

This research is practical and descriptive-developed and case study that did in public sector in 2023. To do this research in Delphi method 12 people of experts and a sample which includes 20 people of the managers, university professors and experts of companies for Analytical Hierarchy Process (AHP) questionnaire was chosen. Experts must have at least the following 3 characteristics:

- At least a master's degree
- More than 10 years of work experience in the field of finance or public sector auditing
- Study field of accounting or financial management or other related matters in such a way that they have completed at least 20 accounting units.
- In finally 80% of the respondents in the Delphi phase were male and 75% were male in the rank analysis process phase, and all the respondents had work experience between 15 and 30 years. The field of study of at least 70% of people was accounting.

In this research four principal question were set forth. To explore the first and second research question (recognition of factors) used Delphi method and then for tirth and forth question (rating factors) used the researcher-maker questionnaire of Analytical Hierarchy Process (AHP).

The Delphi research method is a flexible research technique that has been successfully used to explore new concepts within and outside of the systems of knowledge. It is an iterative process to collect and modify judgments of experts using a series of data collection, analysis techniques

and brainstorming for problems, opportunities, solutions and forecasts. The Delphi method is carried out in three rounds to finally reach a consensus among the experts regarding the components.

The AHP is an approach for facilitating decision-making by organizing perceptions, feelings, judgments and memories into a multi-level hierarchic structure that exhibits the forces that influence.

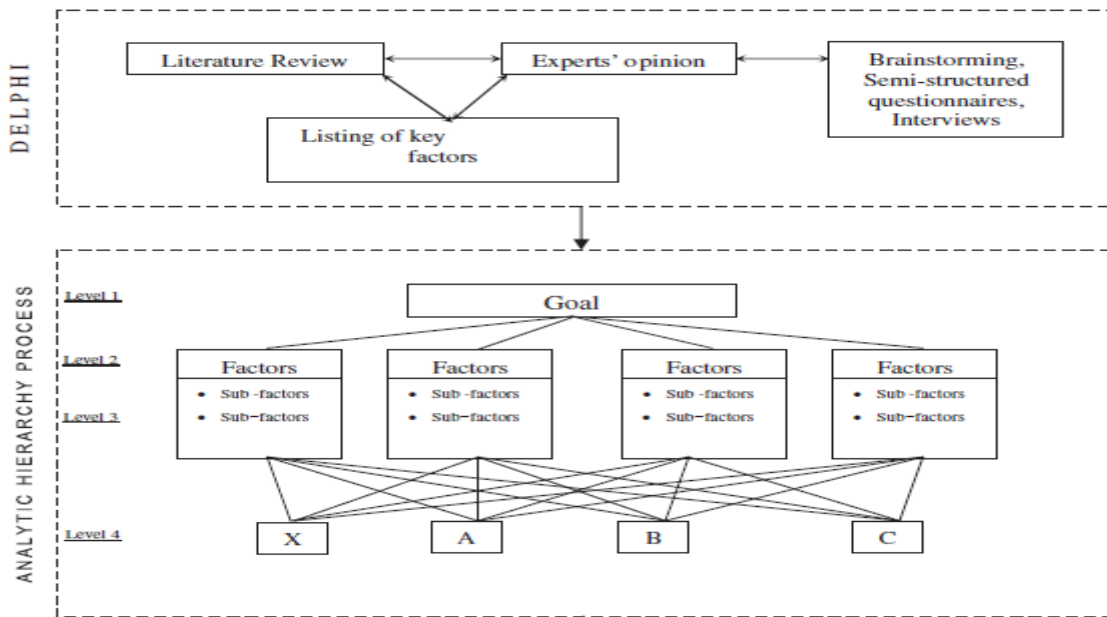


Figure1: Delphi and AHP

The Analytical Hierarchy Process method is related to (rank matrix) pairwise comparisons. These comparisons form a matrix whose elements are obtained by comparing the elements of each row with the elements of the columns. In Analytical Hierarchy Process method, First, the scales should be compared

and then the comparisons should be combined to determine the order of priorities. The matrices that are formed are as follows:

forming the matrix of pairwise comparisons for the desired option, (2) obtaining the priorities obtained by using the answers, (3) forming the normalized matrix

of pairwise comparisons (for this, add the sum of each column and divide the elements of each column by its total so that the elements of the matrix are normalized), (4) averaging the values obtained from each row and the final conclusion (arriving at the answer and determining the priorities).

The criteria of transferability, reliability, applicability and verifiability for the validity and reliability of the results have been considered by the respondents, and therefore the validity and reliability of the Delphi questionnaires and the AHP were confirmed.

Answers to the first and second questions of the research

First question: What are the components based on the study of the research literature and the opinion of experts to operationalize the effectiveness of the internal audit of the Ministry of Health and Medical Education?

Second question: What components are effective on the effectiveness of internal audit of the Ministry of Health and Medical Education based on the study of research literature and the opinion of experts?

Answers to questions: After exchanging opinions between people, the following results were obtained in three rounds:

The first round of Delphi

After collecting experts' opinions and aggregating them, the following were obtained:

Components of operationalizing the effectiveness of internal audit from the supply side

Capability of the internal audit department, size of the internal audit department, organizational arrangement, scope limitation, compliance with applicable standards, characteristics of the audited unit, independence of the internal auditor, neutrality of the internal auditor, risk management advice, management letter to address the weaknesses of internal controls, outsourcing, quality of audit work, leadership style of managers and duties of internal audit unit.

Components of operationalizing the effectiveness of internal audit from the demand side

Management support of internal audit, staff support of internal audit, interaction between internal auditor and independent auditor, cooperation with audit committee, information and communication, presence of follow-up process, support control environment and cultural dimensions.

Effective components on the objective effectiveness of internal audit

The degree of practicality of the internal audit program, the time required to complete the audit program, the percentage of recommended implementation, the time of publication of the internal audit report, the time to solve the internal audit findings, time management, the number of audit findings and the value of the audit.

Effective components on the subjective effectiveness of internal audit

Perceived internal audit effectiveness, satisfaction of managers, satisfaction of employees, satisfaction of other stakeholders, perceived added value for the organization.

Finally, by summarizing all the contents presented by the experts, the following factors were identified and were finally agreed upon:

The components of the operationalization of the effectiveness of internal audit from the aspect of supply

The ability of the internal audit department to carry out activities

Compliance with application standards

Organizational arrangement and position of internal auditor

Independence of the internal auditor

Risk management consulting

Management and leadership styles of managers

The components of operationalizing the effectiveness of internal audit from the demand side

Management support of internal audit

Interaction between internal auditor and independent auditor

Cooperation with the audit committee

Existence of follow-up and support process

Attention to the cultural dimensions of the organization

Components affecting the effectiveness of internal audit (objective effectiveness)

The degree of practicality of the internal audit program

Time required to complete the audit program

The time of publishing the internal audit report

Time to resolve internal audit findings

time management

Number of audit findings and audit value

Factors affecting the effectiveness of internal audit (mental effectiveness)

Effectiveness of internal audit as perceived by stakeholders

Stakeholder satisfaction

Perceived added value for the organization

Answers to the third and fourth research questions

As mentioned, for data analysis, factors were first identified by Delphi method, and then at this stage, factors are compared and prioritized with the rank analysis process. At this stage, the opinions of 20 people with high education and high work experience were used.

After this stage, the ranking analysis process questionnaire is used to answer the third and fourth research questions.

Third question: Which of the components of the operationalization of the effectiveness of the internal audit of the Ministry of Health and Medical Education are more important?

Fourth question: Which of the components of the effectiveness of the internal audit of the Ministry of Health and Medical Education are more important?

Instructions for answering the questions: In answering the questions of the questionnaire, the

examined items should be compared in pairs according to their importance or priority in attention, and the result should be written in the desired place according to the numbers specified in the table. We have to compare each of the options two by two based on the criteria. Fuzzy numbers are used for pairwise comparison of options. A scale is used for scoring as follows:

If the mental components are more preferable than the objective components and the score is completely better, the score is 9, and its opposite, that is, the objective components compared to the subjective components, is 1 divided by 9. The rest of the table is filled in the same way. After the comparisons are done, the data is transferred to the comparison matrix.

The following table shows the average response and ranking of the operationalization components of the effectiveness of the internal audit from the supply side:

Table 2: scale

Preference the same	slightly better	better	much better	completely better
1	3	5	7	9

Table 3: matrix calculations

Success factors	Objective components	Mental components
Objective components	1	1/9
Mental components	9	1

Table 4: Ranking of internal audit effectiveness operationalization components from the supply side

Components of operationalizing the effectiveness of internal audit from the supply side	Overall average of responses	rank (importance level)
The ability of the internal audit department to carry out activities	0.4	1
Compliance with application standards	0.06	5
Organizational arrangement and position of internal auditor	0.13	4
Independence of the internal auditor	0.04	6
Risk management consulting	0.23	2
Management and leadership styles of managers	0.13	3

The following column chart also shows the importance of each component:

The following table shows the average response and ranking of the internal audit effectiveness operationalization components from the demand side:

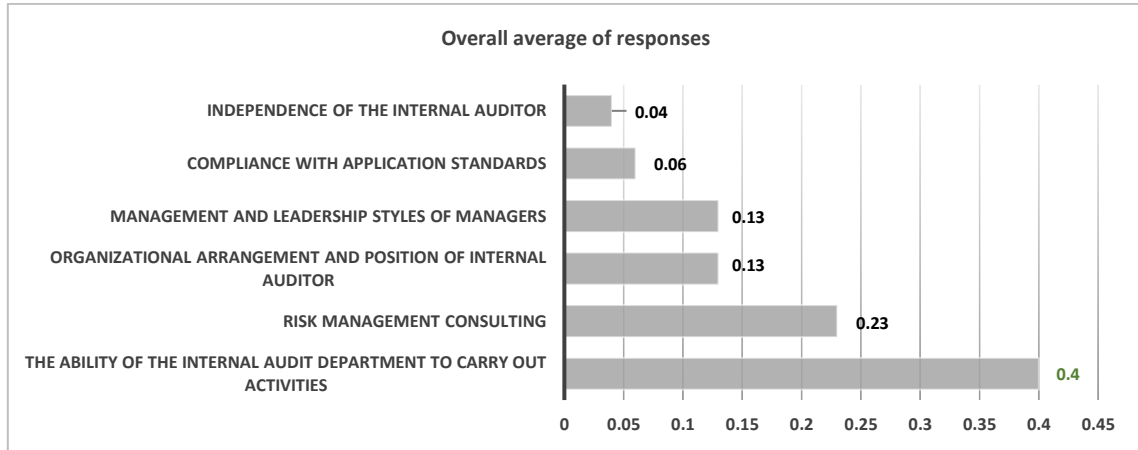


chart 1: Comparison of the operationalization components of internal audit effectiveness from the supply side

Table 5: Ranking of internal audit effectiveness operationalization components from the demand side

The components of operationalizing the effectiveness of internal audit from the demand side	Overall average of responses	rank (importance level)
Management support of internal audit	0.44	1
Interaction between internal auditor and independent auditor	0.09	4
Cooperation with the audit committee	0.08	5
Existence of follow-up and support process	0.22	2
Attention to the cultural dimensions of the organization	0.15	3

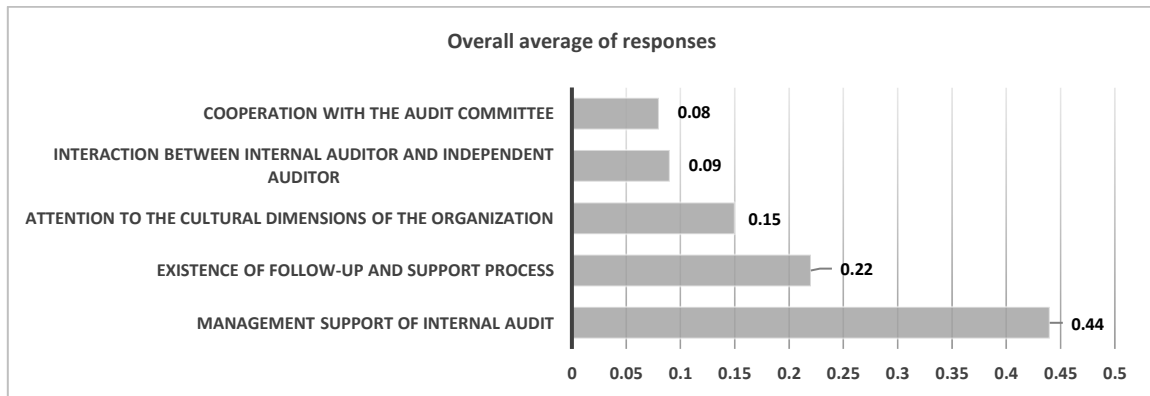


Chart 2: Comparison of the operationalization components of internal audit effectiveness from the demand side

The following table shows the average response and ranking of the components affecting the effectiveness of internal audit (objective effectiveness):

Table 6 : Ranking of components affecting the effectiveness of internal audit (objective effectiveness)

Effective components on the objective effectiveness of internal audit	Overall average of responses	rank (importance level)
The degree of practicality of the internal audit program	0.18	2
Time required to complete the audit program	0.05	6
The time of publishing the internal audit report	0.03	7
Time to resolve internal audit findings	0.38	1
time management	0.16	3
Number of audit findings	0.1	4
Audit value	0.08	5

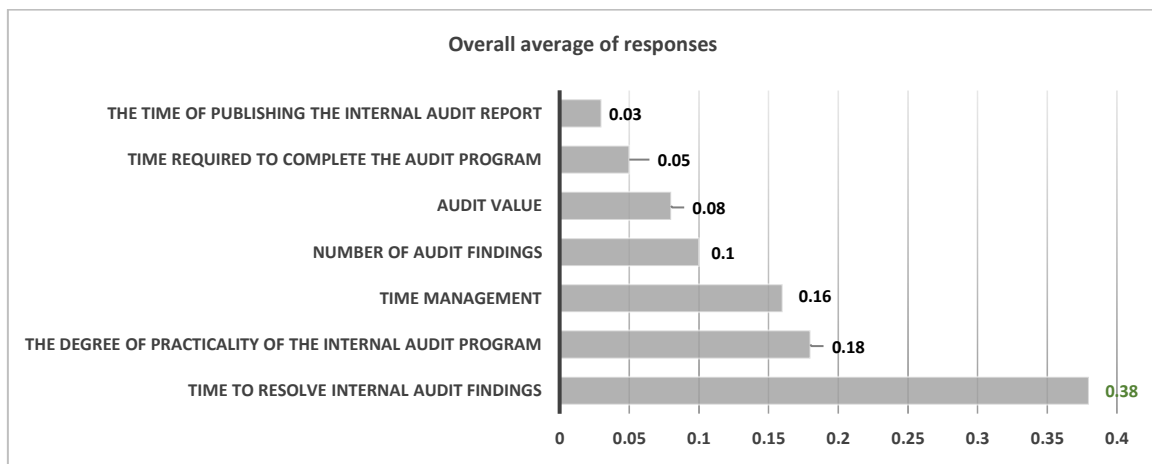


Chart 3: Comparison of the components affecting the effectiveness of internal audit (objective effectiveness)

Table 7: Ranking of the components affecting the effectiveness of internal audit (subjective effectiveness)

Effective components on the mental effectiveness of internal audit	Overall average of responses	rank (importance level)
Effectiveness of internal audit as perceived by stakeholders	0.6	1
Stakeholder satisfaction	0.14	3
Perceived added value for the organization	0.26	2

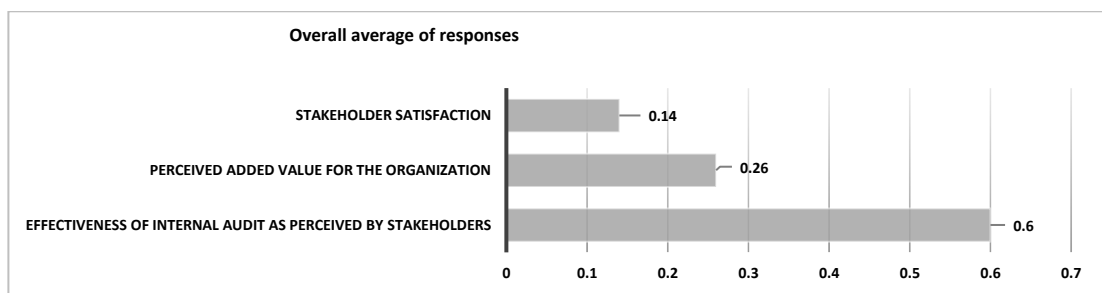


Chart 4: Components affecting the effectiveness of internal audit (mental effectiveness)

Result

The components affecting the effectiveness of internal audit included objective and subjective effectiveness, and the operationalization components of internal audit effectiveness were identified in two dimensions of supply and demand. The most important component of objective effectiveness was the time to resolve internal audit findings, and the most important component of subjective effectiveness was the effectiveness of internal audit perceived by the stakeholders. From the supply side of operationalization, the ability of the internal audit department to perform activities was also the most important component, and from the demand side, management support from internal audit was the most important component.

The components of operationalizing the effectiveness of internal audit from the supply side included the following in order of importance:

The ability of the internal audit department to carry out activities

Risk management consulting

Organizational arrangement and position of internal auditor
Management and leadership styles of managers

Compliance with application standards

Independence of the internal auditor

The components of operationalizing the effectiveness of internal audit from the demand side included the following in order of importance:

Management support of internal audit

Existence of follow-up and support process

Attention to the cultural dimensions of the organization

Interaction between internal auditor and independent auditor

Cooperation with the audit committee

The components affecting the objective effectiveness of internal audit included the following in order of importance:

Time to resolve internal audit findings

The degree of practicality of the internal audit program

Time Management

Number of audit findings

Audit value

Time required to complete the audit program

The time of publishing the internal audit report

The factors affecting the subjective effectiveness of internal audit included the following in order of importance:

Effectiveness of internal audit as perceived by stakeholders

Perceived added value for the organization

Stakeholder satisfaction

Conclusions

The birth of internal audit and internal controls in the world was the fight against fraud. Internal audit is one of the regulatory pillars of the organization, which has a reassuring and advisory role. Internal audit has an important and vital role in the management, governance and operations of any organization, including the public sector; Therefore, organizations that have an effective and appropriate internal audit unit have a better assessment of identifying internal and external environment risks, processes and their commercial and administrative systems. The concept of effectiveness in the internal audit unit in the public sector is a suitable standard for evaluating, controlling and measuring performance in the field of internal audit activities, which is in accordance with the highest international standards to achieve the demands of audit activities.

Effectiveness and operationalization are two important dimensions of internal audit effectiveness. The public sector should pay attention to the effective dimensions and operationalization of the effectiveness of internal audit, and considering the increasing importance of internal audit in the public sector in recent years, the results of this research are effective in increasing the effectiveness of internal audit.

The components that exist for quantifying and operationalizing the effectiveness of internal audit are proposed from two aspects of supply and demand. From the supply side, things like the capability of the internal audit department, the size of the internal audit department, organizational arrangement, scope limitation, compliance with applicable standards, the characteristics of the audited unit, the independence of the internal auditor, the impartiality of the internal auditor, risk management consulting, outsourcing, and the quality of audit work. and includes the leadership style of managers. From the demand side, it includes things like management support of internal audit, interaction between internal auditor and independent auditor, cooperation with the audit committee, information and communication, existence of follow-up process, support control environment and cultural dimensions. The components affecting the

effectiveness of internal audit are classified into two objective and subjective categories. The objective effectiveness includes the degree of practicality of the internal audit plan, the time required to complete the audit plan, the recommended implementation percentage, the publication time of the internal audit report, the time to solve the internal audit findings, time management, the number of audit findings and the value of the audit, and subjective effectiveness includes Perceived internal audit effectiveness is stakeholder satisfaction and perceived added value for the organization. The most important components of operationalizing the effectiveness of internal audit were from the aspect of providing the capability of the internal audit department in carrying out activities.

The most important components of operationalizing the effectiveness of internal audit from the aspect of demand for management support from internal audit.

The most important factor affecting the effectiveness of internal audit (objective effectiveness) was the time to resolve internal audit findings.

The most important factor affecting the effectiveness of internal audit (subjective effectiveness) was the effectiveness of internal audit perceived by the stakeholders.

Government planners and government agencies can manage potential risks more easily by increasing the effectiveness of internal audit activities and ultimately increase financial discipline.

In the first stage, the necessary fields for empowering internal audit should be taken into consideration by the organization. Because the main policies of organizations are formed by managers, managers should pay a lot of attention to internal audit. If the internal audit has findings, the findings should be taken into consideration to increase the motivation of the employees of the internal audit unit. Finally, the stakeholders' view of the internal audit should be constantly taken into account.

Considering the differences in laws and regulations and economic, political, social and cultural conditions as well as existing risks for each country, the effectiveness of internal audit is different in each country and the results of this research cannot be widely used for other countries. and it is suggested that the results of this research be localized for other countries.

According to the results of the research and the identification of internal and external factors affecting the brand and that each of them has subsets, it is suggested to future researchers to conduct the following research and compare with the results of this research:

Examining the relationship between internal audit effectiveness characteristics and fraud management in the public sector.

Examining the relationship between the characteristics of internal audit effectiveness and the improvement of audit reports in the public sector.

Investigating the relationship between internal audit effectiveness characteristics and improving internal controls in the public sector.

Investigating the relationship between internal audit effectiveness characteristics and risk management in the public sector.

Examining the relationship between the characteristics of internal audit effectiveness and the improvement of intellectual capital in the public sector.

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